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| APPLICATION NO.                        | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/522,034                             | 01/21/2005  | Norio Nakayama       | 018765-208          | 1521             |
| 21839                                  | 7590        | 03/07/2007           | EXAMINER            |                  |
| BUCHANAN, INGERSOLL & ROONEY PC        |             |                      | BERMAN, SUSAN W     |                  |
| POST OFFICE BOX 1404                   |             |                      | ART UNIT            | PAPER NUMBER     |
| ALEXANDRIA, VA 22313-1404              |             |                      | 1711                |                  |
| SHORTENED STATUTORY PERIOD OF RESPONSE |             | MAIL DATE            | DELIVERY MODE       |                  |
| 3 MONTHS                               |             | 03/07/2007           | PAPER               |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/522,034             | NAKAYAMA ET AL.     |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Susan W. Berman        | 1711                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-12 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                        |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/05, 6/06, 8/05</u> . | 6) <input type="checkbox"/> Other: _____.  |

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 1, 2, and 4, the use of the phrase "general formula" renders the claims indefinite because it is not clear whether applicant intends to claim compounds of the formulae set forth or to include additional compounds of the same general kind.

With respect to claim 10: It is not clear what is intended by the phrase "wherein a curing layer of 2  $\mu\text{m}$  thickness that the composition is coated on the surface of a resin plate having a thiourethane bond or an epithiosulfide bond...". Does applicant intend to recite "wherein a curable layer of 2  $\mu\text{m}$  thickness coated on the surface of a resin plate...and then cured has..." the resicte properties? What is meant by a resin plate having a thiourethane bond or an epithiosulfide bond? Does applicant intend to recite a resin plate comprising a material containing a thiourethane bond or an epithiosulfide bond? The claim language should be reworded to clearly set forth the subject matter intended to be claimed. It is noted that the claim, as written, is drawn to the uncured composition of claim 1, not to the cured product of the composition of claim 1. Therefor, the properties set forth are merely intended properties of a future intended product.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2 and 10-12 are rejected under 35 U.S.C. 102(e) as being anticipated by

Shustack et al (6,656,990). Shustack et al disclose curable high refractive index compositions comprising metal oxide nanoparticles and a high refractive index monomer or oligomer. The oligomers disclosed include a (meth)acrylate functional thioether (column 6, lines 64-66, and column 7, lines 3-20). Compositions comprising bis(4-methacryloylthiophenyl)sulfide high refractive index monomer and nanoparticles are taught in column 10, lines 10-29, and in the Examples.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shustack et al (6,656,990) in view of each of JP 08-295665, JP 09-132563 or JP 09-309923. Shustack et al do not teach each of the specific formulae set forth in claim 2. Each of J '665, J'563 and J '923 teaches thio(meth)acrylates of the formulae set forth in instant claim 2 for compositions to provide high refractive index products.

J '665 discloses compositions comprising thio (meth)acrylates that give lenses having excellent optical characteristics, high refractive index and excellent scratch resistance. Thio(meth)acrylates of formula (1) corresponding to formula (5) in instant claim 2 are taught. Photoinitiators are taught in paragraph [0014]. J "665 does not mention fillers or particles.

J '563 discloses compositions comprising thio (meth)acrylates that give lenses having excellent optical characteristics, high refractive index and excellent scratch resistance. Thio(meth)acrylates of formula (1) corresponding to formula (6) in instant claim 2 are taught. Photoinitiators are taught in paragraph [0017]. J '563 does not mention fillers or particles.

J '923 discloses compositions comprising thio (meth)acrylates that give lenses having excellent optical characteristics, high refractive index and excellent scratch resistance. Thio(meth)acrylates of formula (1) are taught. Photoinitiators are taught in paragraphs [0034-0035]. J '923 does not mention fillers or particles.

It would have been obvious to one skilled in the art at the time of the invention to employ any of the thio(meth)acrylates taught by J '665, J'563 or J '923 instead of or in addition to the high refractive index thio(meth)acrylate monomer in the compositions disclosed by Shustack et al. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation that the thio(meth)acrylate monomers taught by each of the Japanese

references would function in the same manner as the thio(meth)acrylate monomer disclosed by Shustack et al in the compositions disclosed by Shustack et al. Shustack et al provide motivation by teaching use of a high refractive index thio(meth)acrylate monomer. Each of J '665, J'563 and J '923 teaches thio(meth)acrylate monomers for high refractive index properties.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shustack et al (6,656,990) in view of each of JP 08-295665, JP 09-132563 or JP 09-309923, as applied to claim 2 above, and further in view of EP 0 378 895. Shustack et al disclose compositions for making optical devices having a high refractive index but do not mention including a (meth)acrylate compound having a thiourethane bond. EP '895 discloses polythiourethane (meth)acrylate compounds for preparing plastic lenses having a high refractive index and low dispersion of refractive index (page 2, lines 36-40). EP '895 teaches adding filler (page 6, lines 19-21).

It would have been obvious to one skilled in the art at the time of the invention to include a thiourethane (meth)acrylate, as taught by EP '895, in the compositions disclosed by Shustack et al. Shustack et al provide motivation by teaching compositions comprising high refractive index oligomers. EP '895 provide motivation by teaching that the disclosed polythiourethane (meth)acrylates have a high refractive index. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation of providing useful a optical device having a high refractive index, as taught by each of Shustack et al and EP '895.

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Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shustack et al (6,656,990), as applied to claim 1 above, and further in view of EP 0 378 895. Shustack et al disclose compositions for making optical devices having a high refractive index but do not mention including a (meth)acrylate compound having a thiourethane bond. EP '895 discloses polythiourethane (meth)acrylate compounds for preparing plastic lenses having a high refractive index and low dispersion of refractive index (page 2, lines 36-40). EP '895 teaches adding filler (page 6, lines 19-21).

It would have been obvious to one skilled in the art at the time of the invention to include a thiourethane (meth)acrylate, as taught by EP '895, in the compositions disclosed by Shustack et al. Shustack et al provide motivation by teaching compositions comprising high refractive index oligomers. EP '895 provide motivation by teaching that the disclosed polythiourethane (meth)acrylates have a high refractive index. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation of providing useful a optical device having a high refractive index, as taught by each of Shustack et al and EP '895.

#### ***Allowable Subject Matter***

Claims 4-7 and 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. the cited art does not teach adding hydroxy-functional (meth)acrylates and β-diketones to the compositions disclosed by Shustack et al.

***Conclusion***

The following references are cited as art of interest.

JP 08-179123 A discloses compositions comprising fine inorganic particles such as antimony oxide, tin oxide, indium tin mixed oxide, cerium oxide a titania and a zirconia [0009]. Polyfunctional acrylates, not including thio acrylates, are disclosed. The compositions are for obtaining a hard-coat film having a high refractive index, excellent wear resistance and quickly crosslinked.

JP 2001-049148 discloses radiation curable compositions comprising 5-35% by weight particles, such as zirconia and alumina, 3-50 micrometers in diameter ( see paragraphs [0006-0009] and [0029]). (Meth)acrylate monomers are taught [0012]. Dispersants [0020] and photoinitiators [0031] are disclosed. J '148 mentions only cyclohexane thio(meth)acrylate among numerous (meth)acrylates and does not provide any motivation to select the thio(meth)acrylate compound [0013].

Ja Chisholm et al (6,844,950, filed 01-07-2003) disclose microstructure-bearing articles of high refractive index comprising blends of oligomeric urethane (meth)acrylate, (meth)acrylate monomer and nanoparticles of ethylenically unsaturated functionalized titanium or zirconium compounds. The (meth)acrylate monomers taught include thio(meth)acrylates (column 4, lines 16-23).

Chen et al (6,551,710) disclose a UV curable primer composition for coating optical articles comprising a polythio and an allyl or vinyl monomer. The primer composition comprises as thio(meth)acrylate monomer as taught in column 17, lines 36-43 and column 18, lines 39-67.

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An abrasion-resistant hard coat is taught in column 27, lines 36-59. An anti-reflective coating comprising metal oxides is taught from column 27, line 65, to column 28, line 11.

Klemm et al (6,887,402) disclose transferring a hydrophobic top coat onto an optical substrate. An anti-reflective coating comprising metal oxides is taught in column 6, lines 3-6. Klemm et al teach that the optical substrates are obtained by polymerizing thio(meth)acrylic monomer compositions and polythiourethane precursor monomer compositions (column 9, lines 42-67).

Burns et al (5,518,789) disclose photopolymerizable compositions comprising thioether(meth)acrylates for protective layers on metal substrates having improved adhesion.

Fujii et al (5,908,876) teach optical resin compositions comprising a (meth)acrylated thiourethane for obtaining an optical resin with a high refractive index, high Abbe number, excellent in transparency and optical homogeneity.

Keita et al (5,741,831) disclose compositions comprising thio(meth)acrylate monomers for manufacturing transparent ophthalmic lenses.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan W. Berman whose telephone number is 571 272 1067. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571 272 1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SB  
2/21/07

*Susan Berman*  
Susan W Berman  
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Art Unit 1711